CLAIMS

I claim:

1. A method for treating low solids content sediment from a body of water, said sediment including halogenated organic compound contaminants, the method comprising the steps of:

(1) dewatering the sediment to obtain a stream of water having a concentrated solids content of about 50% by weight;

(2) adding air or oxygen, a fuel, and a reactant to the concentrated solids stream, said reactant selected from the group consisting of sodium carbonate, sodium hydroxide, hydrogen peroxide, iron, aliphatic hydrocarbons, and mixtures thereof;

(3) pressurizing the concentrated solids stream to a pressure in the range of about 800 to 2500 psi;

(4) preheating the pressurized stream by passing the stream through a heat exchanger;

(5) conveying the preheated stream into a reactor operating at a self-sustaining temperature sufficient to dehalogenate and decompose or denature the contaminant compounds;

(6) returning the dehalogenated and decomposed or denatured stream to the heat exchanger to provide heat for the preheating step; and,

(7) reducing the pressure of the stream for further processing.

2. The method as set forth in claim 1 including the step of operating the reactor at a temperature in the range of 800°C to 2000°C.

3. The method as set forth in claim 1 including, prior to said pressurizing step, the step of adding to the concentrated solids stream a catalyst selected from the group consisting of carbon, graphite, and iron

4. The method as set forth in claim 1 wherein the dehalogenated stream includes heavy metal contaminants and the pressure reducing step comprises directing the stream through a small variable orifice to generate a liquid and

atomized solids fraction and a volatilized fraction, and including the additional steps of:

(1) condensing the volitalized fraction;

(2) combining the condensate with the liquid and atomized solids fraction to provide a second concentrated solids stream ;

(3) adding the water fraction from the dewatering step to the second concentrated solids stream to provide a dilute solids stream; and,

(4) gravimetrically separating the solids from the dilute solids stream in stages to separate the heavy metals from the remaining dilute solids stream to provide a heavy metals solid stream and a remaining solids stream.

5. The method as set forth in claim 4 including the steps of:

(1) dewatering the heavy metals solids stream to provide a concentrated heavy metals fraction and a liquid fraction; and,

(2) dewatering the remaining solids stream to provide a treated solids fraction and a second liquid fraction.

6. The method as set forth in claim 1 including the steps of:

(1) providing a first barge for process equipment utilized in performing steps (1) and (2);

(2) providing a second barge for process equipment utilized in performing steps (3) - (7); and,

(3) providing one or more low pressure process flow connection between said barges.